



Environmental risk assessment of hydrofluoropolyethers (HFPEs)

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Abstract:

Hydrofluoropolyethers (HFPEs), a new family of linear oligomeric fluorinated fluids, are being used as potential replacements for halon, hydrochlorofluorocarbons (HCFCs) and perfluorocarbons (PFCs) that have been listed as ozone depleting substances and/or greenhouse gases. Because of their physicochemical properties, these substances may be industrially used as cleaning solvents in the electronic components, fire suppression agents in the fire protection, and heat transfer fluids in the heat exchangers. From the environmental, ecological, and healthy points of view, it is urgent to understand their environmental risks of these HFPEs. This article aimed at introducing these HFPEs in physiochemical properties and potential uses, and evaluating their environmental risks (i.e., global warming, photochemical potential, and environmental partition). Further, the updated data on their toxicological profiles and potential exposure hazards from their degradation products were also addressed in this paper. It is indicated that HFPEs still pose some significant hazards, especially global warming and photochemical potentials, to the atmosphere. Regarding the estimation of partition properties (i.e., vapor pressure, octanol-water partition coefficient and bioconcentration) of HFPEs, the predicted values of logKow for several HFPEs were found to be below zero, suggesting that they should possess very low potential for bioaccumulation in the environment.

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Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Unspecified Exposure

Geographic Feature:

resource focuses on specific type of geography

None or Unspecified

Geographic Location:

resource focuses on specific location

Global or Unspecified

Health Co-Benefit/Co-Harm (Adaption/Mitigation):



specification of beneficial or harmful impacts to health resulting from efforts to reduce or cope with greenhouse gases

A focus of content

Health Impact:

specification of health effect or disease related to climate change exposure

General Health Impact

Mitigation/Adaptation:

mitigation or adaptation strategy is a focus of resource

Mitigation

Resource Type:

format or standard characteristic of resource

Review

Timescale:

time period studied

Time Scale Unspecified

Vulnerability/Impact Assessment:

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

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